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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,651	01/23/2004	Koichi Yoshikawa	450100-04890	8556

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,651

Applicant(s)

YOSHIKAWA ET AL

Examiner

Audrey Y. Chang

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 4, 2006 has been entered.
2. This Office Action is also in response to applicant's amendment filed on March 7, 2006, which has been entered into the file.
3. By this amendment, the applicant has amended claims 1 and 13.

Response to Amendment

4. The amendment filed on March 7, 2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **claims 1 and 13 have been amended to include the phrase “display means are vertically placed so that arrival positions of rays of light passing through said image-forming means which are not diffracted by said light-condensing means do not coincide with said N observing positions”**. The specification simply fails to disclose such explicitly. In particular, the specification fails to disclose the display means are “vertically placed” since there is no such vertical direction ever defined. Furthermore, the specification fails to disclose how could this arrangement of the display means will enable the light that are not diffracted by the light-condensing means do not coincide with said N observing position.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-6, 8 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added matters are set forth in the paragraph above.

Claim Objections

7. Claims 1-6, 8 and 13 are objected to because of the following informalities:

(1). The amended phrase “wherein said display means are vertically *placed* so that arrival positions of rays of light passing through said image-forming means, which are *not diffracted* by said light-condensing means do not coincide with said N observing positions” recited in claims 1 and 13 are completely confusing since it is **really not clear** what are these rays of light and how do they relate to the three-dimensional display apparatus. It is believed that the light rays that are not diffracted and not condensed by the light-condensing means will NOT form image which therefore will contribute NOTHING to the three-dimensional display apparatus. These light rays therefore are not critical to the three-dimensional display apparatus and have nothing to do the three-dimensional display. Furthermore, it is completely unclear with respect to what are these display means “**vertically placed**”. The vertical

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direction is defined by what? The applicant is respectfully noted in order for three-dimensional image to be observed the display means (1 to 11 Figure 1) are placed along a *horizontal line* with respect to the observation position A. The vertical direction if measured with respect to the observation position A has no meaning and no affect to the three dimensional image display.

The scopes of the claims with this amended phrase are therefore really unclear since there is no logical relationship between these *non-image forming rays* and the images formed for three-dimensional display apparatus.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-6, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kirk (PN. 5,379,133) in view of the patent issued to Malcolm et al (PN. 5,037, 166).

Kirk teaches a *stereoscopic or three-dimensional image display* apparatus that is comprised of a *display means* having a plurality of *cathode ray tubes* (01-05, Figure 5) for displaying N images that are viewable at N different viewing points, (011-015), wherein the N different viewing points also serve as the *N observation points*. Kirk teaches that the images displayed by the display means are being formed at a *holographic integrated combiner screen* (92) that serves as the *light-condensing means* for *diffracting* the images formed on the screen to the N different observation points, (011-015), (please see column 8, line 7 to column 9 line 35). It is implicitly true that a hologram has wavelength and angle selectivity

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which means only the incident light on the particular hologram with the angle of incident and wavelength that match the particular angle and wavelength of the light used to record the hologram will be diffracted by the hologram to the observation point and the light rays that *do not* have the matching incident angle and wavelength will pass the hologram without being diffracted and therefore will not reach the observation point.

This reference has met all the limitations of the claims. Kirk teaches explicitly that the images displayed by the CRTs are being formed on the holographic screen, however it does not teach *explicitly* that an image forming means or lenses are being used to achieve such. But it is implicitly true that certain image forming means must be present to carry out the image-forming function in Kirk image display apparatus and lenses are typical image forming means in the optical art to form images on a screen. Malcolm et al in the same field of endeavor teaches explicitly to use a lens (129, Figure 6) to focus (namely forming) the image displayed by the CRT (101) on a holographic screen (102), (please see column 5, lines 10-20). It would then have been obvious to one skilled in the art to apply the teachings of Malcolm et al to use lenses as image-forming means, if not the case already, in the three-dimensional image display apparatus of Kirk to achieve the image forming function by simply lens means.

Claims 1 and 13 have been amended to include the phrase “*wherein said display means are vertically placed so that arrival positions of rays of light passing through said image forming means, which are not diffracted by said light-condensing means do not coincide with said N observing positions*”. This feature is not supported by the specification explicitly and is rejected under 35 USC 112, first paragraph and is objected for the reasons stated above. It can only be examined in the broadest interpretation. Also since the claims fail to define what is considered to be the vertical direction, this vertical direction is examined in the broadest interpretation. Kirk teaches that the image display means or the cathode ray tubes (01-05, Figure 5) are placed *vertically* with respect to the perpendicular direction with respect to the axis Z, (please see Figure 5, where the vertical direction or plane is defined with

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respect to the plane of the page), so that the image light from each of the display means with the proper wavelength and angular direction matched with the reconstruction condition of the holographic combiner (92) will be properly diffracted by the holographic combiner to form the respective images. It is implicitly true the image light from the display means that do not match the reconstruction condition of the holographic combiner will not be diffracted by the holographic combiner and will not form image and therefore these light will advance through the holographic combiner but not coincide with the images that define the observation positions. This is the implicit property of a holographic optical element.

With regard to claim 2, Kirk teaches that the number of image is three or more, (please see Figure 5).

With regard to claim 3, Kirk teaches explicitly that the N images viewable from N different viewing points may be N images of the same object captured at N different viewing perspectives, (please see Figures 9-10).

With regard to claim 4, Kirk teaches that the holographic integrated combiner screen comprises a *number* of fringe patterns which means it comprises a plurality of holograms, (please see column 3, lines 17-26).

With regard to claims 5-6 and 8, Kirk teaches that the holographic integrated combiner screen *focuses* the images to the observation points (011-015) that are located at a *predetermined observation plane*. The observation plane is parallel to the holographic screen. Kirk also teaches that the gap between two or more of the observation points equal to a normal interpupillary distance of human eyes for stereoscopic image viewing to occur, (please see column 8, lines 50-65).

10. Claims 1-6, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Aritake et al (PN. 6,061,083) in view of the patent issued to Malcolm et al (PN. 5,037,166).

Aritake et al teaches a *stereoscopic or three-dimensional image display* apparatus (Figures 17 and 35) that is comprised of a *display device* (302) for displaying N images (#1 to #n) that are viewable at N different viewing points, (304-1 to 304-n or 1 to n), wherein the N different viewing points also serve as the *N observation points*. Aritake et al teaches that the images displayed by the display means are being formed at an image distribution part or parallel scanning part that may include *a multiple layers of holograms*, (please see layers 371, with hologram 374 in Figure 49) that serves as the *light-condensing means* for *diffracting* the images formed on the light-condensing means to the N different observation points, (1 to n), (please see column 21, lines 3-19 and column 27, lines 12-65). It is implicitly true that a hologram has wavelength and angle selectivity which means only the incident light on the particular hologram with the angle of incident and wavelength that match the particular angle and wavelength of the light used to record the hologram will be diffracted by the hologram to the observation point and the light rays that *do not* have the matching incident angle and wavelength will pass the hologram without being diffracted and therefore will not reach the observation point.

This reference has met all the limitations of the claims. Aritake et al teaches explicitly that the images displayed by the CRTs are being formed on the image distribution part or the holographic light-condensing means, however it does not teach *explicitly* that an image forming means or lenses are being used to achieve such. But it is implicitly true that certain image forming means must be present to carry out the image-forming function in Aritake et al image display apparatus and lenses are typical image forming means in the optical art to form images on a screen. Malcolm et al in the same field of endeavor teaches explicitly to use a lens (129, Figure 6) to focus (namely forming) the image displayed by the image display device (101) on a holographic screen (102), (please see column 5, lines 10-20). It would then have been obvious to one skilled in the art to apply the teachings of Malcolm et al to use lenses as image-forming means, if not the case already, in the three-dimensional image display apparatus of Aritake et al to achieve the image forming function by simply lens means.

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Claims 1 and 13 have been amended to include the phrase “*wherein said display means are vertically placed so that arrival positions of rays of light passing through said image-forming means, which are not diffracted by said light-condensing means do not coincide with said N observing positions*”.

This feature is not supported by the specification explicitly and is rejected under 35 USC 112, first paragraph and is objected for the reasons stated above. It can only be examined in the broadest interpretation. Furthermore, the claims fail to define what is considered to be the vertical direction and it is therefore examined here with the broadest interpretation. It is implicitly true that the image light from each of the display means with the proper wavelength and angular direction matched with the reconstruction condition of the holographic image distributing part (please see Figure 35, or 371 Figure 49) will be properly diffracted by the holographic image distributing part to form the respective images. It is also implicitly true the image light from the display means that do not match the reconstruction condition of the holographic combiner will not be diffracted by the holographic combiner and will not form image and therefore these light rays will advance through the holographic combiner but not coincide with the images that define the observation positions. This is the implicit property of a holographic optical element. As disclosed in Figure 19B, Aritake et al teaches that the image display means with the multi-viewpoint images are placed *vertically* with respect to the horizontal extend of the N viewing points.

With regard to claim 2, Aritake et al teaches that the number of image is three or more, (please see Figure 35).

With regard to claim 3, Aritake et al teaches explicitly that the N images viewable from N different viewing points may be N images of the same object captured at N different viewing perspectives, (please see Figures 60A).

With regard to claim 4, Aritake et al teaches that the image distributing part or the parallel scanning part comprises a *multiple* of holographic layers, (please see Figure 49).

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With regard to claims 5-6 and 8, Aritake et al teaches that the image distributing part focuses the images to the observation points (1-n) that are located at a *predetermined observation plane*. The observation plane is parallel to the image distributing part. It is implicitly true that the gap between two or more of the observation points equal to a normal interpupillary distance of human eyes in order for stereoscopic image viewing to occur, (please see column 21, lines 5-17).

Response to Arguments

11. Applicant's arguments filed March 7, 2006 have been fully considered but they are not persuasive.

12. Applicant's arguments are mainly drawn to the newly amended features in the claims and they have been fully addressed in the paragraphs above.

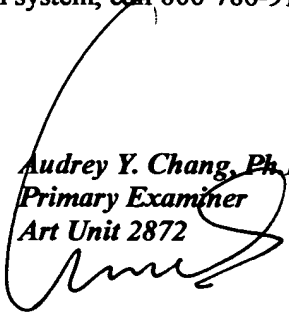
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.